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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,351	06/20/2007	Gerard Hillion	PET-2271	8163

7590 09/11/2009
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EXAMINER

PO, MING CHEUNG

ART UNIT	PAPER NUMBER
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1797

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09/11/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,351	Applicant(s) HILLION ET AL.	
	Examiner MING CHEUNG PO	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Office Action Summary

1. This is the initial office action for application 10/590351 filed on 06/20/2007.
2. Claims 1-18 are pending and have been fully considered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over BRADIN (U.S 5,578,090) in view of English translation of HILLION (FR 2,794,768).

Regarding claims 1-6 and 12, BRADIN teaches an alternate fuel composition that includes a fuel additive composition. The fuel additive composition is prepared by esterifying the free fatty acids and etherifying glycerol with one or more olefins in the presence of an acid catalyst. BRADIN teaches in lines 34-41 of column 3 that the fatty acid alkyl esters and the glyceryl ethers can be prepared by any means known to those of skill in the art. Means for preparing fatty acid alkyl esters include **transesterifying** triglycerides with **alcohols** in the presence of an **acid or base catalyst**. The alcohol is taught in lines 16-20 of column 4 to be any **C₁₋₆ straight, branched, or cyclic alcohol, but preferably ethanol**. The glyceryl ethers are prepared by reacting glycerol with an alkyl halide in the presence of a base or an olefin or an alcohol in the presence of an acid catalyst. The olefin is taught in lines 62-67 of column 4 and lines 1-6 of column 5

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to be preferably an unsaturated straight, branched, or cyclic hydrocarbon of C₂ to C₁₀.

BRADIN does not seem to explicitly teach a heterogeneous catalyst.

However, HILLION teaches in the first paragraph of the description a process for the manufacture of a fatty acid ester by the use of a **heterogeneous catalyst chosen from zinc oxide, a mixture of zinc oxide and alumina or a zinc aluminate consistent with the formula: $ZnAl_2O_4$, $xZnO$, yAl_2O_3 ($x, y = 0-2$), with a 1-18C mono-alcohol.**

It would be obvious to one of ordinary skill in the art to use the catalyst that HILLION as the transesterification catalyst in the process that BRADIN teaches.

The motivation to do so would be for the manufacture of a fatty acid ester to a high state of purity.

Regarding claims 7 and 8, BRADIN teaches in lines 17-21 of column 6 that the esterification reactions can be run in both **batch-type** and continuous reactors.

Regarding claim 11, BRADIN teaches in lines 62-67 of column 4 that **isobutylene (isobutene)** may be used as the olefin in the etherification reaction.

Regarding claims 13 and 14, BRADIN teaches in lines 25-32 of column 5 that the esters may be used in biodiesel fuel.

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over BRADIN (U.S. 5,578,090) in view of English translation of HILLION (FR 2794768) and further in view of BOURNAY (U.S. 6,878,837).

The above discussion of BRADIN in view of HILLION is incorporated herein by reference.

Modified BRADIN does not seem to explicitly teach the conditions of the reactor.

However, BOURNAY teaches that alkyl esters of fatty acids and high purity glycerin can be produced by using a process comprising a set of transesterification reactions between a vegetable or animal oil and an aliphatic monoalcohol employing a heterogeneous catalyst. BORUNARY teaches the conditions in lines 8-65 of column 4: upflow reactor; 30×10^5 to 80×10^5 Pa; 453 to 493 K; HSV of 1.2 h^{-1} to 0.1 h^{-1} . At least 90% by weight of the oil is converted. More than one reactors may be used. The mixture after reaction undergoes a depressurization phase. In lines 1-6 of column 5, the liquid is decanted in a decanter drum.

It would be obvious to one of ordinary skill in the art to apply the conditions that BORUNARY teaches with a reasonable expectation of success given that both BRADIN and BOURNAY are directed towards the production of esters from fatty acids.

The motivation to use the method that BOURNAY teaches can be found in lines 49-59 of column 2 in BOURNAY. BOURNAY teaches that high purity of glycerin can be formed.

Although BOURNAY does not seem to explicitly teach the ranges claimed in the present invention it would be obvious to one of ordinary skill in the art since it has been held that where the general conditions are known, optimization or workable ranges involve only routine experimentation to one of ordinary skill in the art. See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention.

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6. Claims 1 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over DELGADO PUCHE (USPGPUB 2003/0167681) in view of English translation of HILLION (FR 2794768).

Regarding claims 1 and 16, DELGADO PUCHE teaches a procedure to produce biodiesel fuels with improved properties at low temperature by **transesterify triglycerides with an alcohol, preferentially methanol or ethanol, in the presence of acid or base catalysts to produce mixtures of methyl or ethyl esters of fatty acids and crude glycerine; isolate the crude glycerin obtained as a secondary product; and then to make all or part of the glycerin react with aldehydes, ketones, to obtain the corresponding acetals.**

DELGADO PUCHE does not seem to explicitly teach a heterogeneous catalyst.

However, HILLION teaches in the first paragraph of the description a process for the manufacture of a fatty acid ester by the use of a **heterogeneous catalyst chosen from zinc oxide, a mixture of zinc oxide and alumina or a zinc aluminate consistent with the formula: $ZnAl_2O_4$, $xZnO$, yAl_2O_3 ($x, y = 0-2$), with a 1-18C mono-alcohol.**

It would be obvious to one of ordinary skill in the art to use the catalyst that HILLION as the transesterification catalyst in the process that BRADIN teaches.

The motivation to do so would be for the manufacture of a fatty acid ester to a high state of purity.

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claims 17 and 18, DELGADO PUCHE teaches in paragraph 8 that the glycerine acetals mixed with methyl or ethyl esters of fatty acids in **biodiesel fuels**.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over DELGADO PUCHE (USPGPUB 2003/0167681) in view of English translation of HILLION (FR 2794768) in view of NAKAGUCHI (U.S. 3,714,202).

The above discussion of DELGADO PUCHE is incorporated herein by reference.

DELGADO PUCHE does not seem to explicitly state using an acid catalyst in the acetalization step.

However, NAKAGUCHI teaches in lines 22-25 of column 8 that acetal synthesis may be performed with an acid catalyst.

It would be obvious to one of ordinary skill in the art to use an acid catalyst in the acetalization step in the process that DELGADO PUCHE teaches.

The motivation to do so would be to speed up the reaction by use of a catalyst.

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MING CHEUNG PO whose telephone number is (571)270-5552. The examiner can normally be reached on 9:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571)272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ellen M McAvoy/
Primary Examiner, Art Unit 1797

Ming Cheung Po
Patent Examiner